

## SEQUENCE LISTING

<110> Istituto di Ricerche di Biologia Molecolare P. Angeletti S.P.A.

<120> GB VIRUS B BASED REPLICONS AND REPLICON  
ENHANCED CELLS

<130> ITR0037Y PCT

<150> 60/386,655

<151> 2002-06-06

<150> 60/348,573

<151> 2002-01-15

<160> 19

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 8069

<212> RNA

<213> Artificial Sequence

<220>

<223> GBV-B Replicon

<400> 1

```

accacaaaca cuccaguuug uuacacuccg cuaggaaugc uccuggagca ccccccuaag 60
cagggcgugg gggauuuccc cugcccuguc gcagaagggg ggagccaacc accuuaguau 120
guaggcgggc ggacucauga cgcucgcgug augacaagcg ccaagcuuga cuuggauggc 180
ccugaugggc guucaugggu ucgguggugg uggcgcuuaa ggcagccucc acgcccacca 240
ccucccagau agagcggcgg cacuguaggg aagaccgggg accggucacu accaaggacg 300
cagaccucuu uuugaguauc acgccuccgg aaguaguugg gcaagcccac cuauaugugu 360
ugggaugguu gggguuagcc auccauaccg uacugccuga uaggguccuu gcgaggggau 420
cugggagucu cguagaccgu agcacaugcc uguuauuuu acucaaacaa guccuguacc 480
ugcgcccaga acgcgcaaga acaagcagac ggggcgcgcc augauugaac aagauggauu 540
gcacgcaggu ucuccggccg cuugggugga gaggcuaauc ggcuaugacu gggcacaaca 600
gacaaucggc ugcucugaug ccgcccuguu ccggcuguca gcgcaggggc gcccgguucu 660
uuuugucaag accgaccugu ccggugcccu gaaugaacug caggacgagg cagcgcggu 720
aucguggcug gccacgacgg gcguuccuug cgcagcugug cucgacguug ucacugaagc 780
gggaagggac uggcugcuau ugggcgaagu gccggggcag gaucuccugu caucucaccu 840
ugcuccugcc gagaaggua ccaucauggc ugaugcaaug cggcggcugc auacgcuuga 900
uccggcuacc ugcccuaucg accaccaagc gaaacaucgc aucgagcgag cacguacucg 960
gauggaagcc ggucuugucg aucaggauga ucuggacgag gagcaucagg ggcucgcgcc 1020
agccgaacug uucgccaggc ucaaggcgcg caugcccgac ggcgaggau ucgucgugac 1080
ccauggcgau gccugcuugc cgaauaucuau gguggaaaau ggccgcuuuu cuggauucau 1140
cgacuguggc cggcugggug uggcggaccg cuaucaggac auagcguugg cuacccguga 1200
uauugcugag gagcuuggcg gcgaaugggc ugaccgcuuc cucgugcuuu acgguaucgc 1260
cgcucccgau ucgcagcgca ucgccuucua ucgccuucuu gacgaguucu ucugaguuaa 1320
aacagaccac aacgguuucc cucuagcggg aagggcggug ugcguuuguc uauauguuau 1440
cuaacguuac uggccgaagc cgcuuggaau aagggcggug ugcguuuguc uauauguuau 1440
uuuccaccu auugccgucu uuuggcaaug ugagggcccg gaaaccuggc ccugucuucu 1500
ugacgagcau uccuaggggu cuuuccccuc ucgccaaagg aaugcaaggu cuguugaau 1560
ucgugaagga agcaguuccu cuggaagcuu cuugaagaca aacaacgucu guagcgaccc 1620

```

uuugcaggca gcggaacccc ccaccuggcg acaggugccu cugcggccaa aagccacgug 1680  
 uauaagauac accugcaaag gcggcacaaac cccagugcca cguugugagu uggauaguug 1740  
 uggaaagagu caaauggcuc uccucaagcg uauucaacaa ggggcugaag gaugcccaga 1800  
 agguacccca uuguauggga ucugaucugg ggcucggug cacaugcuuu acauguguuu 1860  
 agucgagguu aaaaaacguc uaggcccccc gaaccacggg gacgugguuu uccuuugaaa 1920  
 aacacgauaa uaccauggca ccuuuuacgc ugcagugucu cucugaacgu ggcacgcugu 1980  
 cagcgauggc aguggucaug acugguauag acccccgaac uuggacugga acuaucua 2040  
 gauuaggauac ucuggccacu agcuacaugg gauuuguuug ugacaacgug uuguauacug 2100  
 cucaccaugg cagcaagggg cgccgguugg cucauccac aggcuccaua cacccaauaa 2160  
 ccguugacgc ggcuaaugac caggacaucu aucaaccacc auguggagcu gggucccuua 2220  
 cucggugcuc uugcggggag accaaggggu aucugguaac acgacugggg ucauugguug 2280  
 aggucaauaa auccgaugac ccuuauuggu guguugcgg gggccuuccc auggcuguug 2340  
 ccaagggguu uucaggugcc ccgauucugu gcuccuccgg gcauguuauu gggauuguua 2400  
 ccgugcuag aauuucuggc gguucaguca gccagauuag gguuaggccg uuggugugug 2460  
 cuggauacca uccccaguac acagcacau ccacucuga uacaaaaccu acugugccua 2520  
 acgaguauuc agugcaauu uuaauugccc ccacuggcag cggcaaguca accaaauuac 2580  
 cacuuucua caugcaggag aaguauagg ucuugguccu aaaucccagu guggcuacaa 2640  
 cagcaucaau gccaaaguac augcacgcga cguacggcgu gaauccaaau ugcuaauua 2700  
 auggcaauug uaccaacaca ggggcuucac uuacguacag cacauauggc auguaccuga 2760  
 ccggagcaug uucccggaac uaugauguaa ucauuuguga cgaaugccau gcuaccgaug 2820  
 caaccaccgu guugggcauu ggaaaggucc uaaccgaagc uccauccaaa aauguuaggc 2880  
 uagugguucu ugccacggcu accccccug gaguaauccc uacaccacau gccaacauaa 2940  
 cugagauuca auuaaccgau gaaggcacua uccccuuua caaaaaacac ugugaugagc 3000  
 aaaaucugaa gaaagggaga caccuuauuc uugagggcuac caaaaaacac ugugaugagc 3060  
 uugcuaacga guuagcucga aagggaauaa cagcugucuc uuacuauagg ggaugugaca 3120  
 ucuaaaaaa ccugagggc gaguguguag uaguugccac ugaugccuug uguacagggg 3180  
 acacugguga cuuugauucc guguaugacu gcagccuau gguagaaggc acaugccaug 3240  
 uugaccuuga ccuacuuc accaugggug uucgugugug cggggguuca gcaauaguua 3300  
 aaggccagcg uaggggcccgc acaggccgug ggagagcugg cauauacuac uauguagacg 3360  
 ggaguuguac ccuucgggu augguuccug aaugcaacau uguugaaggc uucgacgagc 3420  
 ccaaggcaug guaugguuug ucaucaacag aagcucaaac uauucuggac accuaucgca 3480  
 cccaaccugg guuaccugcg auaggagcaa auuuggacga gugggcugau cucuuuuaa 3540  
 uggucaaccc cgaaccuua uuugucaaua cugcaaaaag aacugcugac aauuauguuu 3600  
 uguugacugc agcccaacua caacuguguc aacaguauug cuaugcugcu cccaugacg 3660  
 caccacggug gcaggggagc cgguuuggga aaaaaccuug uggggguucug uggcgcuugg 3720  
 acggcgcuca cgccuguccu ggcccagagc ccagcgaggu gaccagauac caaauugcu 3780  
 ucacugaagu caauacuuc gggacagccg cacucgcugu uggcguugga guggcuauug 3840  
 cuuaucuagc cauugacacu uuuggcgcca cuugugugcg gcguugcugg ucuauuacau 3900  
 cagucccuac cggugcuacu gucgccccag uggugacga agaagaauc guggaggagu 3960  
 gugcaucau cauucccuug gaggccauug uugcugcau ugacaagcug aagaguacaa 4020  
 ucaccacaac uaguuccuuc acauuggaaa ccgcccuga aaaacuuaac accuucuuug 4080  
 ggccucaugc agcuacaau cuugcuaua uagaguauug cuuauuugc gguauuacu accccacuac 4140  
 cugacaaucc cuuugcauca cugucauuau uuggaggcgc aaugcgucc aagcuuacag 4200  
 cucacaagau caaaauuguc uucaugaug cggggcguc ggaacagcu cuugguacau 4260  
 acgcuagagg cgacuggcg uucaugaug uaggcgguu ugcugccgc ucauccacug 4320  
 ggacaucggg gguuuuguc uuugacaug uaggcgguu uagggauag cuugcugguu 4380  
 cuugcuugac auuuuuuugc uugaugggug aguggcccac uauggauag cuugcugguu 4440  
 uagucuacuc cgcuucaac ccggccgag gaguugugg cguuuugua gcuugugcaa 4500  
 uguuugcuuu gacaacagca gggccagau acuggcccaa cagacuucuu acuaugcuug 4560  
 cuaggagcaa cacuguaugu aaugaguacu uuauugccac ugcugacau aucagcuugc auccguuggc 4620  
 uacugggcau ucuggaggga ucuaccccc ggaugcuug gggucuagag auuuggcagu 4680  
 uccacacccc gacggaggau gauugcgcc auuugcuua auguccuua agcuggaguu cagagcaug 4740  
 acgugugcaa uuucuuug uauugcuua auguccuua agcuggaguu cagagcaug 4800  
 uuaacauucc ugguguccu uucuaacgcu gccagaagg guacaagggc ccuggaug 4860  
 gaucaggau gcuccaagca cgcuugccau gggugcuga acucaucuu ucuguugaga 4920

augguuuugc	aaaacuuuac	aaaggaccca	gaacuuguuc	aaauuacugg	agagggggcug	4980
uuccagucac	cgcuaaggcug	uguggggucgg	cuagaccgga	cccaacugau	uggacuaguc	5040
uugucgucaa	uuauggcggu	aggggacuacu	guaaauauga	gaaauuggga	gaucacaucu	5100
uuguuacagc	aguauccucu	ccaaaugucu	guuucaccca	ggugccccc	accuugagag	5160
cugcaguggc	cguaggacggc	guacagguuc	aguguuauuc	aggugagccc	aaaacuccuu	5220
ggacgacauc	ugcuugcugu	uacgguccug	acgguaagg	uaaaacuguu	aagcuucccu	5280
uccgcguuga	cggucacaca	ccuggugugc	gcaugcaacu	uaauuugcgu	gaugcacuug	5340
agacaaauga	cuguaauucc	acaaacaaca	cuccuaguga	ugaagccgca	guguccgcuc	5400
uuguuucaa	acaggaguug	cggcguacaa	accaauugcu	ugaggcaauu	ucagcuggcg	5460
uugacaccac	caaacugcca	gccccucca	ucgaagaggu	agugguaaga	aagcgccagu	5520
uccgggcaag	aacugguucg	cuuaccuugc	ccccccucc	gagauccguc	ccaggagugu	5580
cauguccuga	aagccugcaa	cgaagugacc	cguuagaagg	uccuucacac	cuccuccuu	5640
caccaccugu	ucuacaguug	gccaugccga	ugccccuguu	gggagcgggg	gaguguaacc	5700
cuuucacugc	aaauuggaugu	gcaaugaccg	aaacaggcgg	aggcccugau	gauuuaccca	5760
guuaccucc	caaaaaggag	gucucugaau	ggucagacga	aaguugguca	acggcuacaa	5820
ccgcuuccag	cuacguuacu	ggccccccgu	acccuaagau	acgggggaaag	gauuccacuc	5880
agucagcccc	cgccaaacgg	ccuacaaaaa	agaaguuggg	aaagagugag	uuuucgugca	5940
gcaugagcua	cacuuggacc	gacgugauua	gcuuacaaac	ugcuucuaaa	guucugucug	6000
caacucgggc	caucacuagu	gguuuccuca	aacaaagauc	auuggugua	gugacugagc	6060
cgcggggaugc	ggagcuuaga	aaacaaaaag	ucacuauuaa	uagacaaccu	cuguuccccc	6120
caucauacca	caagcaagug	agauuggcua	aggagaaagc	uucaaaaguu	gucgguguca	6180
ugugggacua	ugaugaagua	gcagcucaca	cgcccucuaa	gucugcuaag	ucccacauca	6240
cuggccuucg	gggcacugau	guucguucug	gagcagccc	caaggcuguu	cuggacuugc	6300
agaagugugu	cgaggcaggu	gagauaccga	gucuuuauuc	gcaaacagug	auaguuccaa	6360
aggaggaggu	cuucgugaag	acccccaga	aaccaacaaa	gaaaccccc	aggcucaucu	6420
cguaccccc	ccuugaaaug	agauguguu	agaagaugua	cuacggucag	guugcuccug	6480
acguaguuaa	agcugucaug	gggagugcgu	acggguuuugu	agauccacgu	acccguguca	6540
agcgucuguu	gucgaugugg	ucacccgaug	cagucggagc	cacaugcgau	acaguguguu	6600
uugacaguac	caucacaccc	gaggauauca	uggugggagac	agacauacuac	ucagcagcua	6660
aacucaguga	ccaacaccga	gcuggcacuuc	acaccuugc	gaggcaguua	uacgcuggag	6720
gaccgaugau	cgcuuauugau	ggccgagaga	ucggauaucg	uagguguuag	ucuccggcg	6780
ucuauacuac	cucaaguucc	aacaguuuuga	ccugcuggcu	gaagguaauu	gcugcagccg	6840
aacaggcugg	caugaagaac	ccucgcuuuc	uuauuugcgg	cgaugauugc	accguaaauu	6900
ggaaaagcgc	cggagcagau	gcagacaaa	aagcaaugcg	ugucuuugcu	agcuggauga	6960
aggugauggg	ugcaccacaa	gauugugugc	cucaacccaa	auacaguuu	gaagaauuaa	7020
caucaugcuc	aucaaauguu	accucuggaa	uuaccaaaag	uggcaagccu	uacuacuuuc	7080
uuacaagaga	uccucguauc	ccccuuggca	ggugcucugc	cgagggucug	ggauacaacc	7140
ccagugcugc	guggauuggg	uaucaauuac	aucacuacc	auguuugugg	guuagccgug	7200
uguuggcugu	ccauuucaug	gagcagaugc	ucuuugagga	caaacuuccc	gagacuguga	7260
ccuuugacug	guauuggaaa	aaauuauacg	ugccugua	agaucugccc	agcaucauug	7320
cuggugugca	cggauuugag	gcuuucucgg	uggugcgcu	caccaacgcu	gagauccuca	7380
gaguuuucca	aucacuaaca	gacaugacca	ugccccccu	gcgagccug	cgaaagaaag	7440
ccaggggcggu	ccucgcccag	gccaagaggc	guggcgaggc	acacgcaaaa	uuggcucgcu	7500
uccuucucug	gcaugcuaca	ucuagaccuc	uaccagauuu	ggauaagacg	agcguggcuc	7560
gguaacaccac	uuucaauuau	ugugauguuu	acuccccgga	ggggggaug	uuuguuacac	7620
cacagagaag	auugcagaag	uuucuuguga	aguauuuggc	ugucauuugu	uuugcccuag	7680
ggcucauugc	uguuggauua	gccaucagcu	gaacccccaa	auucaaaaau	aacuaacagu	7740
uuuuuuuuuu	uuuuuuuuuu	agggcagcgg	caacagggga	gaccccgggc	uuuacgaccc	7800
cgccgaugug	aguugggcca	ccauggguga	ucagaaccgu	uucgggugaa	gccaugguc	7860
gaaggggaug	acgucccuuc	uggcucaucc	acaaaaaccg	ucucgggug	gugaggaguc	7920
cuggcugugu	gggaagcagu	caguauaaau	cccugcugug	guggugacgc	cucacgacgu	7980
acuuguccgc	ugugcagagc	guaguaccaa	gggcugcacc	ccgguuuuug	uuccaagcgg	8040
agggcaaccc	ccgcuuggaa	uuaaaaacu				8069

&lt;211&gt; 9397

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; GBV-B Replicon

&lt;400&gt; 2

```

accacaaaca ctccagtttg ttacactccg ctaggaatgc tectggagca cccccctag 60
cagggcgtgg gggatttccc ctgcccgctc gcagaagggt ggagccaacc accttagtat 120
gtaggcggcg ggactcatga cgctcgctg atgacaagcg ccaagcttga cttggatggc 180
cctgatgggc gttcatgggt tcggtgggtg tggcgcttta ggcagcctcc acgcccacca 240
cctcccagat agagcggcgg cactgtaggg aagaccgggg accggtcact accaaggacg 300
cagacctctt tttgagtatc acgcctccgg aagtagttgg gcaagcccac ctatatgtgt 360
tgggatgggt ggggttagcc atccataccg tactgcctga tagggctcct gcgaggggat 420
ctgggagtct cgtagaccgt agcacatgcc tgttatttct actcaaaaca gtcctgtacc 480
tgcgcccaga acgcgcaaga acaagcagac gcaggcttca tatcctgtgt ccattaaaac 540
atctgttgaa aggggacaac gagcaaagcg caaagtccag cgcatgctc ggcctcgtaa 600
ttacaaaatt gctggtatcc atgatggctt gcagacattg gctcaggctg ctttgccagc 660
tcatggttgg ggacgccaag accctcgcca taagtctcgc aatcttggaa tccttctgga 720
ttaccttttg ggggtgattg gtgatgttac aactcacaca cctctagtag gccgctgggt 780
ggcaggagcg gtcgttcgac cagtctgcca gatagtacgc ttgctggagg atggagtcaa 840
ctgggctact gggtgggttc gtgtccacct ttttgtggta tgtctgctat ctttggcctg 900
tccctgtagt ggggcgcggg tccctgacct agacacaaat accacaatcc tgaccaattg 960
ctgccagcgt aatcaggtta tctattgttc tccttccact tgtctacacg agcctgggtg 1020
tgtgatctgt gcggacgagt gctgggttcc cgccaatccg tacatctcac acccttccaa 1080
ttggactggc acggactcct tcttggctga ccacattgat tttgttatgg gcgctcttgt 1140
gacctgtgac gcccttgaca ttggtgagtt gtgtgggtgc tgtgtattag tcggtgactg 1200
gcttgtcagg cactggctta ttcacataga cctcaatgaa actggtactt gttacctgga 1260
agtgccact ggaatagatc ctgggttccct aggggtttatc ggggtggatgg ccggcaaggt 1320
cgaggctgtc atcttcttga ccaaactggc ttcacaagta ccatacgcta ttgcgactat 1380
gttttagcagt gtacactacc tggcgggttg cgctctgac tactatgcct ctcggggcaa 1440
gtggtatcag ttgctcctag cgcttatgct ttacatagaa gcgacctctg gaaaccccat 1500
cagggtgccc actggatgct caatagctga gtttgtctcg cctttgatga taccatgtcc 1560
ttgccactct tatttgagtg agaattgtgc ataacaactc catatcttgg taccctata caatccctgg 1620
caggcctgtc actctagagt ataacaactc catatcttgg taccctata caatccctgg 1680
tgcgagggga tgtatggtta aattcaaaaa taacacatgg ggttgttgcc gtattcgcaa 1740
tgtgccatcg tactgacta tgggactga tgcagtgtgg aacgacactc gcaacactta 1800
cgaagcatgc ggtgtaacac catggctaac aaccgcatgg cacaacgggt cagccctgaa 1860
attggctata ttacaatacc ctgggtctaa agaaatgttt aaacctcata attggatgtc 1920
aggccatttg tattttgagg gatcagatac ccctatagtt tacttttatg accctgtgaa 1980
ttccactctc ctaccaccgg agaggtgggc taggttgccc gtgaaagacc tagccacagg 2040
tggttcttgg ttacaggttc cgcaagggtt ttacagtgat ttatatccg ccacgggtgc 2100
attgatcacc aaagacaaag cctggaaaaa ttatcagggtc ttatatccg ccacgggtgc 2160
tttgtctctt acgggagtta ccaccaaggc cgtggtgcta attctgttgg ggttgtgtgg 2220
cagcaagtat cttatttttag cctacctctg ttacttgtcc ctttgttttg ggcgcgttc 2280
tggttaccct ttgcgtctg tgctcccatc ccagtcgtat ctccaagctg gctgggatgt 2340
tttgtctaaa gctcaagtag ctcccttttg tttgattttc ttcactctgt gctatctccg 2400
ctgcaggcta cgttatgctg cccttttagg gtttgtgccc atggctgcgg gcttgcccct 2460
aactttcttt gttgcagcag ctgctgcccc accagattat gactggtggg tgcgagctct 2520
agtggcaggg ttagttttgt gggccggccg tgaccgtggg caccgcatag ctctgcttgt 2580
aggtccttgg cctctggtag cgcttttaac cctcttgcac ttggttacgc ctgcttcagc 2640
ttttgacacc gagataattg gagggctgac aataccacct gtagtagcat tagttgtcat 2700
gtctcgtttt ggcttctttg ctcacttgtt acctcgctgt gctttagtta actcctatct 2760
ttggcaacgt tgggagaatt ggttttggaa cgttacacta agaccggaga ggttttttct 2820

```

```

tgtgctgggt  tgtttccccc  gtgcgacata  tgacgcgctg  gtgactttct  gtgtgtgtca  2880
cgtagctctc  ctatgtttaa  catccagtg  agcatcgctt  tttgggactg  actctaggg  2940
tagggcccat  agaagtgttg  tgcgtctcg  aaagtgccat  gcttggtatt  ctcatatgt  3000
tcttaagttt  ttcctcttag  tgtttggtga  gaatggtgtg  ttttctata  agcacttgca  3060
tgggtgatgt  ttgcctaatt  attttgcctc  gaaactacca  ttgcaagagc  catttttccc  3120
ttttgaaggg  aaggcaaggg  tctataggaa  tgaagggaaga  cgcttggcgt  gtggggacac  3180
ggttgatggg  ttgcccgttg  ttgcgcgtct  cggcgacctt  gttttcgcag  ggtagctat  3240
gcccgcagat  ggggtgggcca  ttaccgcacc  ttttacgctg  cagtgtctct  ctgaacgtgg  3300
cacgctgtca  gcgatggcag  tggatcatg  tggatatagac  ccccgaaact  ggactgggaa  3360
tatcttcaga  ttaggatctc  tggccactag  ctacatggga  tttgtttgtg  acaacgtgtt  3420
gtatactgct  caccatggca  gcaaggggcg  ccggttggct  catcccacag  gctccataca  3480
cccaataacc  gttgacgcgg  ctaatgacca  ggacatctat  caaccacat  gtggagctgg  3540
gtcccttact  cgggtgctct  gcggggagac  caaggggtat  ctggtaacac  gactggggtc  3600
attggttgag  gtcaataaat  ccgatgacct  ttattggtgt  gtgtgcgggg  cccttcccat  3660
ggctgttgcc  aagggttctt  cagggtgccc  gattctgtgc  tcctccgggc  atgttattgg  3720
gatgttcacc  gctgctagaa  attctggcgg  ttcagtcagc  cagattagg  ttagggcgtt  3780
gggtgtgtgt  ggataccatc  cccagtacac  agcacatgcc  actcttgata  caaacctac  3840
tgtgcctaac  gagtattcag  tgcaaatctt  aattgcccc  actggcagcg  gcaagtcaac  3900
caaattacca  ctttcttaca  tgcaggagaa  gtatgaggtc  tacggcgtga  atcccagtg  3960
ggctacaaca  gcatcaatgc  caaagtacat  gcacgcgacg  tacggcgtga  atccaaattg  4020
ctattttaat  ggcaaatgta  ccaacacagg  ggcttacctt  acgtacagca  catatggcat  4080
gtacctgacc  ggagcatgtt  cccggaacta  tgatgtaatc  attgtgacg  aatgccatgc  4140
taccgatgca  accaccgtgt  tgggcattgg  aaaggtccta  accgaagctc  catccaaaaa  4200
tgtaggcta  gtggttcttg  ccacggctac  cccccctgga  gtaatcccta  caccacatgc  4260
caacataact  gagattcaat  taaccgatga  aggcactatc  ccctttcatg  gaaaaaagat  4320
taaggaggaa  aatctgaaga  aaggagaca  ccttatcttt  gaggctacca  aaaaacactg  4380
tgatgagctt  gctaacgagt  tagctcgaaa  gggaataaca  gctgtctctt  actatagggg  4440
atgtgacatc  tcaaaaatcc  ctgagggcga  ctgtgtagta  gttgccactg  atgccttgtg  4500
tacagggtag  actggtgact  ttgattccgt  gtatgactgc  agcctcatgg  tagaaggcac  4560
atgccatgtt  gaccttgacc  ctactttcac  catgggtgtt  cgtgtgtgcg  gggtttcagc  4620
aatagttaaa  ggccagcgta  ggggccgcac  aggcctgtgg  agagctggca  tataactacta  4680
tgtagacggg  agttgtaccc  cttcgggtat  ggttccctgaa  tgcaacattg  ttgaagcctt  4740
cgacgcagcc  aaggcatggg  tacctgcat  aggagcaaat  ttggacgagt  gggctgatct  4800
ctatcgacc  caacctggg  aaccttcatt  tgtcaatact  gcaaaaagaa  ctgctgacaa  4860
cttttcaatg  gtcaacccc  aaccttcatt  tgtcaatact  gcaaaaagaa  ctgctgacaa  4920
ttatgttttg  ttactgcag  cccaactaca  actgtgtcat  cagtattggc  atgctgctcc  4980
caatgacgca  ccacggtggc  agggagccc  gcttgggaaa  aaaccttgtg  gggttctgtg  5040
gcgcttgac  ggcgctgacg  cctgtcctgg  cccagagccc  agcgaggtga  ccagatacca  5100
aatgtgcttc  actgaagtca  atacttctgg  gacagccgca  ctgctgttg  gcgttggagt  5160
ggctatggct  tatctagcca  ttgacacttt  tggcgccact  tgtgtgcggc  gttgctgggt  5220
tattacatca  gtccctaccg  gtgctactgt  cgccccagtg  gttgacgaag  aagaaatcgt  5280
ggaggagtgt  gcatcattca  ttcccttgg  gggcatgggt  gctgcaattg  acaagctgaa  5340
gagtacaatc  accacaacta  gtcctttcac  attggaaacc  gcccttgaaa  aacttaacac  5400
ctttcttggg  cctcatgcag  ctacaatcct  tgctatcata  gagtattgct  gtggcttagt  5460
cactttacct  gacaatccct  ttgcatcatg  cgtgtttgct  ttcatcgcg  gtattactac  5520
cccactacct  cacaagatca  aaatgttctt  gtcattattt  ggaggcgcaa  ttgcgtccaa  5580
gcttacagac  gctagaggcg  cactggcggt  catgatggcc  ggggctgcgg  gaacagctct  5640
tggtacatgg  acatcggtgg  gttttgtctt  tgacatgcta  ggccgctatg  ctgccgctc  5700
atccactgct  tgcttgacat  ttaaatgctt  gatgggtgag  tggccacta  tggatcagct  5760
tgctggttta  gtctactccg  cgttcaaccc  ggccgcagga  gttgtggcg  tttgtcagc  5820
ttgtgcaatg  tttgctttga  caacagcagg  gccagatcac  tggcccaaca  gacttcttac  5880
tatgcttgct  aggagcaaca  ctgtatgtaa  tgagtacttt  attgccactc  gtgacatccg  5940
caggaagata  ctgggcattc  tggaggcatc  taccctctgg  agtgtcatat  cagcttgcat  6000
ccgttggctc  cacaccccca  cggaggatga  ttgcggcctc  attgcttggg  gtctagagat  6060
ttggcagtag  gtgtgcaatt  tctttgtgat  ttgctttaat  gtccttaaag  ctggagttca  6120

```

```

gagcatgggtt aacattcctg gttgtccttt ctacagctgc cagaaggggt acaagggccc 6180
ctggattgga tcaggtatgc tccaagcacg ctgtccatgc ggtgctgaac tcatcttttc 6240
tggttgagaat ggttttgcaa aactttacaa aggaccacga acttgttcaa attactggag 6300
aggggctgtt ccagtcacacg ctaggctgtg tgggtcggct agaccggacc caactgattg 6360
gactagtctt gtctcaatt atggcgtagg ggactactgt aaatatgaga aattgggaga 6420
tcacatcttt gttacagcag tatctctoc aaatgtctgt ttcacccagg tgccccaac 6480
cttgagagct gcagtgccg tggacggcgt acagggttcag tgttatctag gtgagccaa 6540
aactccttgg acgacatctg cttgtctgta cggtcctgac ggtaagggta aaactgttaa 6600
gcttcccttc cgcgttgacg gtcacacacc tgggtgtgcg atgcaactta atttgctga 6660
tgcaactgag acaaatgact gtaattccac aaacaacact cctagtgatg aagccgcagt 6720
gtccgctctt gttttcaaac aggagtgtcg gcgtacaaac caattgcttg aggcaatttc 6780
agctggcggt gacaccacca aactgccagc cccctccatc gaagaggtag tggtaagaaa 6840
gcgccagttc cgggcaagaa ctggttcgct taccttgccc cccctccga gatccgtccc 6900
aggagtgtca tgtcctgaaa gcctgcaacg aagtgacccg ttagaaggct cttcaaacct 6960
ccctccttca ccacctgttc tacagtggc catgccgatg cccctgttgg gagcgggtga 7020
gtgtaaacct ttcactgcaa ttggatgtgc aatgaccgaa acaggcggag gccctgatga 7080
tttaccaggt taccctccca aaaaggaggt ctctgaatgg tcagacgaaa gttgggtcaac 7140
ggctacaacc gcttcacagt acgttactgg cccccgtac cctaagatac ggggaaagga 7200
ttccactcag tcagccccc ccaaaccggc tacaaaaaag aagttgggaa agagtgaagt 7260
ttcgtgcagc atgagctaca cttggaccga cgtgattagc ttcaaaactg cttctaaagt 7320
tctgtctgca actcgggcca tcaactagtgg tttcctcaaa caaatatcat tgggtgatgt 7380
gactgagccg cgggatgcg agcttagaaa acaaaaagtc actattaata gacaacctct 7440
gttcccccca tcataccaca agcaagttag attggctaag gagaaagctt caaaagttgt 7500
cgggtgtcatg tgggactatg atgaagttag agctcacacg ccctctaagt ctgctaagtc 7560
ccacatcact ggccttcggg gcaactgatg tctgtctgga gcagcccga aggctgttct 7620
ggactgtcag aagtgtgtcg aggcaggtga gataccgagt cattatcggc aaacagtgat 7680
agttccaaag gaggaggtct tcgtgaagac cccccagaaa ccaacaaaga aacccccaa 7740
gtcatctcgt taccaccacc ttgaaatgag atgtgttgag aagatgtact acggtcaggt 7800
tgctcctgac gtagttaaag ctgtcatggg agatgcgtac gggttttag atccacgtac 7860
ccgtgtcaag cgtctgttgt cgatgtggtc acccgatgca gtcggagcca catgcgatac 7920
agtgtgtttt gacagtacca tcacaccgga ggatatcatg gtggagacag acatctactc 7980
agcagctaaa ctcaagtacc aacaccgagc tggcattcac accattgcga ggcagttata 8040
cgctggagga ccgatgatcg cttatgatgg ccgagagatc ggatatcgta ggtgtaggtc 8100
ttccggcgct tatactacct caagttccaa cagtttgacc tgctggctga aggtaaatgc 8160
tgacgccaag caggctggca tgaagaacct tcgcttctct atttgcggcg atgattgcac 8220
cgtaatttgg aaaagcgccg gagcagatgc agacaaacaa gcaatgcgtg tctttgctag 8280
ctggatgaag gtgatgggtg caccacaaga ttgtgtgcct caacccaaat acagtttgg 8340
agaattaaca tcatgtcat caaatgttac ctctggaatt accaaaagt gcaagcctta 8400
ctactttctt acaagagatc ctctgtatccc ccttggcagg tgctctgccg agggctctggg 8460
atacaacccc agtgctgctg ggattgggta tctaatacat cactacccat gtttgtggg 8520
tagccgtgtg ttggctgtcc atttcatgga gcagatgctc tttgaggaca aacttcccga 8580
gactgtgacc tttgactggg atgggaaaaa ttatacgggt cctgtagaag atctgccag 8640
catcattgct ggtgtgcacg gtattgagc tttctcgggt gtgcgctaca ccaacgctga 8700
gatcctcaga gtttcccaat cactaacaga catgaccatg cccccctgc gagcctggcg 8760
aaagaaagcc agggcggtcc tcgccagcgc caagaggcgt ggcggagcac acgcaaaatt 8820
ggctcgtctt cttctctggc atgctacatc tagacctcta ccagatttgg ataagacgag 8880
cgtggctcgg tacaccactt tcaattattg tgatgtttac tccccggagg gggatgtgtt 8940
tgttacacca cagagaagat tgcagaagtt tcttgtgaag tatttggctg tcattgtttt 9000
tgccctaggg ctcatgtctg ttggattagc catcagctga acccccaaat tcaaaattaa 9060
ctaacagttt tttttttttt ttttttttag ggcagcggca acaggggaga ccccggtctt 9120
aacgaccccc ccgatgtgag tttggcgacc atggtggatc agaaccgttt cgggtgaagc 9180
catggtctga aggggatgac gtccctctgt gtcattccac aaaaaccgtc tcgggtgggt 9240
gaggagtctt ggctgtgtgg gaagcagtc gtataattcc cgtcgtgtgt ggtgacgct 9300
cacgacgtac ttgtccgctg tgcagagcgt agtaccaagg gctgcacccc ggttttttgt 9360

```

ccaagcggag ggcaaccccc gcttgggaatt aaaaact

9397

&lt;210&gt; 3

&lt;211&gt; 2864

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; GBV-B Replicon

&lt;400&gt; 3

```

Met Pro Val Ile Ser Thr Gln Thr Ser Pro Val Pro Ala Pro Arg Thr
1          5          10          15
Arg Lys Asn Lys Gln Thr Gln Ala Ser Tyr Pro Val Ser Ile Lys Thr
20          25          30
Ser Val Glu Arg Gly Gln Arg Ala Lys Arg Lys Val Gln Arg Asp Ala
35          40          45
Arg Pro Arg Asn Tyr Lys Ile Ala Gly Ile His Asp Gly Leu Gln Thr
50          55          60
Leu Ala Gln Ala Ala Leu Pro Ala His Gly Trp Gly Arg Gln Asp Pro
65          70          75          80
Arg His Lys Ser Arg Asn Leu Gly Ile Leu Leu Asp Tyr Pro Leu Gly
85          90          95
Trp Ile Gly Asp Val Thr Thr His Thr Pro Leu Val Gly Pro Leu Val
100          105          110
Ala Gly Ala Val Val Arg Pro Val Cys Gln Ile Val Arg Leu Leu Glu
115          120          125
Asp Gly Val Asn Trp Ala Thr Gly Trp Phe Gly Val His Leu Phe Val
130          135          140
Val Cys Leu Leu Ser Leu Ala Cys Pro Cys Ser Gly Ala Arg Val Thr
145          150          155          160
Asp Pro Asp Thr Asn Thr Thr Ile Leu Thr Asn Cys Cys Gln Arg Asn
165          170          175
Gln Val Ile Tyr Cys Ser Pro Ser Thr Cys Leu His Glu Pro Gly Cys
180          185          190
Val Ile Cys Ala Asp Glu Cys Trp Val Pro Ala Asn Pro Tyr Ile Ser
195          200          205
His Pro Ser Asn Trp Thr Gly Thr Asp Ser Phe Leu Ala Asp His Ile
210          215          220
Asp Phe Val Met Gly Ala Leu Val Thr Cys Asp Ala Leu Asp Ile Gly
225          230          235          240
Glu Leu Cys Gly Ala Cys Val Leu Val Gly Asp Trp Leu Val Arg His
245          250          255
Trp Leu Ile His Ile Asp Leu Asn Glu Thr Gly Thr Cys Tyr Leu Glu
260          265          270
Val Pro Thr Gly Ile Asp Pro Gly Phe Leu Gly Phe Ile Gly Trp Met
275          280          285
Ala Gly Lys Val Glu Ala Val Ile Phe Leu Thr Lys Leu Ala Ser Gln
290          295          300
Val Pro Tyr Ala Ile Ala Thr Met Phe Ser Ser Val His Tyr Leu Ala
305          310          315          320
Val Gly Ala Leu Ile Tyr Tyr Ala Ser Arg Gly Lys Trp Tyr Gln Leu
325          330          335
Leu Leu Ala Leu Met Leu Tyr Ile Glu Ala Thr Ser Gly Asn Pro Ile
340          345          350

```

Arg Val Pro Thr Gly Cys Ser Ile Ala Glu Phe Cys Ser Pro Leu Met  
 355 360 365  
 Ile Pro Cys Pro Cys His Ser Tyr Leu Ser Glu Asn Val Ser Glu Val  
 370 375 380  
 Ile Cys Tyr Ser Pro Lys Trp Thr Arg Pro Val Thr Leu Glu Tyr Asn  
 385 390 395 400  
 Asn Ser Ile Ser Trp Tyr Pro Tyr Thr Ile Pro Gly Ala Arg Gly Cys  
 405 410 415  
 Met Val Lys Phe Lys Asn Asn Thr Trp Gly Cys Cys Arg Ile Arg Asn  
 420 425 430  
 Val Pro Ser Tyr Cys Thr Met Gly Thr Asp Ala Val Trp Asn Asp Thr  
 435 440 445  
 Arg Asn Thr Tyr Glu Ala Cys Gly Val Thr Pro Trp Leu Thr Thr Ala  
 450 455 460  
 Trp His Asn Gly Ser Ala Leu Lys Leu Ala Ile Leu Gln Tyr Pro Gly  
 465 470 475 480  
 Ser Lys Glu Met Phe Lys Pro His Asn Trp Met Ser Gly His Leu Tyr  
 485 490 495  
 Phe Glu Gly Ser Asp Thr Pro Ile Val Tyr Phe Tyr Asp Pro Val Asn  
 500 505 510  
 Ser Thr Leu Leu Pro Pro Glu Arg Trp Ala Arg Leu Pro Gly Thr Pro  
 515 520 525  
 Pro Val Val Arg Gly Ser Trp Leu Gln Val Pro Gln Gly Phe Tyr Ser  
 530 535 540  
 Asp Val Lys Asp Leu Ala Thr Gly Leu Ile Thr Lys Asp Lys Ala Trp  
 545 550 555 560  
 Lys Asn Tyr Gln Val Leu Tyr Ser Ala Thr Gly Ala Leu Ser Leu Thr  
 565 570 575  
 Gly Val Thr Thr Lys Ala Val Val Leu Ile Leu Leu Gly Leu Cys Gly  
 580 585 590  
 Ser Lys Tyr Leu Ile Leu Ala Tyr Leu Cys Tyr Leu Ser Leu Cys Phe  
 595 600 605  
 Gly Arg Ala Ser Gly Tyr Pro Leu Arg Pro Val Leu Pro Ser Gln Ser  
 610 615 620  
 Tyr Leu Gln Ala Gly Trp Asp Val Leu Ser Lys Ala Gln Val Ala Pro  
 625 630 635 640  
 Phe Ala Leu Ile Phe Phe Ile Cys Cys Tyr Leu Arg Cys Arg Leu Arg  
 645 650 655  
 Tyr Ala Ala Leu Leu Gly Phe Val Pro Met Ala Ala Gly Leu Pro Leu  
 660 665 670  
 Thr Phe Phe Val Ala Ala Ala Ala Gln Pro Asp Tyr Asp Trp Trp  
 675 680 685  
 Val Arg Leu Leu Val Ala Gly Leu Val Leu Trp Ala Gly Arg Asp Arg  
 690 695 700  
 Gly His Arg Ile Ala Leu Leu Val Gly Pro Trp Pro Leu Val Ala Leu  
 705 710 715 720  
 Leu Thr Leu Leu His Leu Val Thr Pro Ala Ser Ala Phe Asp Thr Glu  
 725 730 735  
 Ile Ile Gly Gly Leu Thr Ile Pro Pro Val Val Ala Leu Val Val Met  
 740 745 750  
 Ser Arg Phe Gly Phe Phe Ala His Leu Leu Pro Arg Cys Ala Leu Val  
 755 760 765  
 Asn Ser Tyr Leu Trp Gln Arg Trp Glu Asn Trp Phe Trp Asn Val Thr  
 770 775 780



Leu Arg Pro Glu Arg Phe Phe Leu Val Leu Val Cys Phe Pro Gly Ala  
 785 790 795 800  
 Thr Tyr Asp Ala Leu Val Thr Phe Cys Val Cys His Val Ala Leu Leu  
 805 810 815  
 Cys Leu Thr Ser Ser Ala Ala Ser Phe Phe Gly Thr Asp Ser Arg Val  
 820 825 830  
 Arg Ala His Arg Met Leu Val Arg Leu Gly Lys Cys His Ala Trp Tyr  
 835 840 845  
 Ser His Tyr Val Leu Lys Phe Phe Leu Leu Val Phe Gly Glu Asn Gly  
 850 855 860  
 Val Phe Phe Tyr Lys His Leu His Gly Asp Val Leu Pro Asn Asp Phe  
 865 870 875 880  
 Ala Ser Lys Leu Pro Leu Gln Glu Pro Phe Phe Pro Phe Glu Gly Lys  
 885 890 895  
 Ala Arg Val Tyr Arg Asn Glu Gly Arg Arg Leu Ala Cys Gly Asp Thr  
 900 905 910  
 Val Asp Gly Leu Pro Val Val Ala Arg Leu Gly Asp Leu Val Phe Ala  
 915 920 925  
 Gly Leu Ala Met Pro Pro Asp Gly Trp Ala Ile Thr Ala Pro Phe Thr  
 930 935 940  
 Leu Gln Cys Leu Ser Glu Arg Gly Thr Leu Ser Ala Met Ala Val Val  
 945 950 955 960  
 Met Thr Gly Ile Asp Pro Arg Thr Trp Thr Gly Thr Ile Phe Arg Leu  
 965 970 975  
 Gly Ser Leu Ala Thr Ser Tyr Met Gly Phe Val Cys Asp Asn Val Leu  
 980 985 990  
 Tyr Thr Ala His His Gly Ser Lys Gly Arg Arg Leu Ala His Pro Thr  
 995 1000 1005  
 Gly Ser Ile His Pro Ile Thr Val Asp Ala Ala Asn Asp Gln Asp Ile  
 1010 1015 1020  
 Tyr Gln Pro Pro Cys Gly Ala Gly Ser Leu Thr Arg Cys Ser Cys Gly  
 1025 1030 1035 1040  
 Glu Thr Lys Gly Tyr Leu Val Thr Arg Leu Gly Ser Leu Val Glu Val  
 1045 1050 1055  
 Asn Lys Ser Asp Asp Pro Tyr Trp Cys Val Cys Gly Ala Leu Pro Met  
 1060 1065 1070  
 Ala Val Ala Lys Gly Ser Ser Gly Ala Pro Ile Leu Cys Ser Ser Gly  
 1075 1080 1085  
 His Val Ile Gly Met Phe Thr Ala Ala Arg Asn Ser Gly Gly Ser Val  
 1090 1095 1100  
 Ser Gln Ile Arg Val Arg Pro Leu Val Cys Ala Gly Tyr His Pro Gln  
 1105 1110 1115 1120  
 Tyr Thr Ala His Ala Thr Leu Asp Thr Lys Pro Thr Val Pro Asn Glu  
 1125 1130 1135  
 Tyr Ser Val Gln Ile Leu Ile Ala Pro Thr Gly Ser Gly Lys Ser Thr  
 1140 1145 1150  
 Lys Leu Pro Leu Ser Tyr Met Gln Glu Lys Tyr Glu Val Leu Val Leu  
 1155 1160 1165  
 Asn Pro Ser Val Ala Thr Thr Ala Ser Met Pro Lys Tyr Met His Ala  
 1170 1175 1180  
 Thr Tyr Gly Val Asn Pro Asn Cys Tyr Phe Asn Gly Lys Cys Thr Asn  
 1185 1190 1195 1200  
 Thr Gly Ala Ser Leu Thr Tyr Ser Thr Tyr Gly Met Tyr Leu Thr Gly  
 1205 1210 1215

Ala Cys Ser Arg Asn Tyr Asp Val Ile Ile Cys Asp Glu Cys His Ala  
 1220 1225 1230  
 Thr Asp Ala Thr Thr Val Leu Gly Ile Gly Lys Val Leu Thr Glu Ala  
 1235 1240 1245  
 Pro Ser Lys Asn Val Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro  
 1250 1255 1260  
 Gly Val Ile Pro Thr Pro His Ala Asn Ile Thr Glu Ile Gln Leu Thr  
 1265 1270 1275 1280  
 Asp Glu Gly Thr Ile Pro Phe His Gly Lys Lys Ile Lys Glu Glu Asn  
 1285 1290 1295  
 Leu Lys Lys Gly Arg His Leu Ile Phe Glu Ala Thr Lys Lys His Cys  
 1300 1305 1310  
 Asp Glu Leu Ala Asn Glu Leu Ala Arg Lys Gly Ile Thr Ala Val Ser  
 1315 1320 1325  
 Tyr Tyr Arg Gly Cys Asp Ile Ser Lys Ile Pro Glu Gly Asp Cys Val  
 1330 1335 1340  
 Val Val Ala Thr Asp Ala Leu Cys Thr Gly Tyr Thr Gly Asp Phe Asp  
 1345 1350 1355 1360  
 Ser Val Tyr Asp Cys Ser Leu Met Val Glu Gly Thr Cys His Val Asp  
 1365 1370 1375  
 Leu Asp Pro Thr Phe Thr Met Gly Val Arg Val Cys Gly Val Ser Ala  
 1380 1385 1390  
 Ile Val Lys Gly Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Ala Gly  
 1395 1400 1405  
 Ile Tyr Tyr Tyr Val Asp Gly Ser Cys Thr Pro Ser Gly Met Val Pro  
 1410 1415 1420  
 Glu Cys Asn Ile Val Glu Ala Phe Asp Ala Ala Lys Ala Trp Tyr Gly  
 1425 1430 1435 1440  
 Leu Ser Ser Thr Glu Ala Gln Thr Ile Leu Asp Thr Tyr Arg Thr Gln  
 1445 1450 1455  
 Pro Gly Leu Pro Ala Ile Gly Ala Asn Leu Asp Glu Trp Ala Asp Leu  
 1460 1465 1470  
 Phe Ser Met Val Asn Pro Glu Pro Ser Phe Val Asn Thr Ala Lys Arg  
 1475 1480 1485  
 Thr Ala Asp Asn Tyr Val Leu Leu Thr Ala Ala Gln Leu Gln Leu Cys  
 1490 1495 1500  
 His Gln Tyr Gly Tyr Ala Ala Pro Asn Asp Ala Pro Arg Trp Gln Gly  
 1505 1510 1515 1520  
 Ala Arg Leu Gly Lys Lys Pro Cys Gly Val Leu Trp Arg Leu Asp Gly  
 1525 1530 1535  
 Ala Asp Ala Cys Pro Gly Pro Glu Pro Ser Glu Val Thr Arg Tyr Gln  
 1540 1545 1550  
 Met Cys Phe Thr Glu Val Asn Thr Ser Gly Thr Ala Ala Leu Ala Val  
 1555 1560 1565  
 Gly Val Gly Val Ala Met Ala Tyr Leu Ala Ile Asp Thr Phe Gly Ala  
 1570 1575 1580  
 Thr Cys Val Arg Arg Cys Trp Ser Ile Thr Ser Val Pro Thr Gly Ala  
 1585 1590 1595 1600  
 Thr Val Ala Pro Val Val Asp Glu Glu Glu Ile Val Glu Glu Cys Ala  
 1605 1610 1615  
 Ser Phe Ile Pro Leu Glu Ala Met Val Ala Ala Ile Asp Lys Leu Lys  
 1620 1625 1630  
 Ser Thr Ile Thr Thr Thr Ser Pro Phe Thr Leu Glu Thr Ala Leu Glu  
 1635 1640 1645

Lys Leu Asn Thr Phe Leu Gly Pro His Ala Ala Thr Ile Leu Ala Ile  
 1650 1655 1660  
 Ile Glu Tyr Cys Cys Gly Leu Val Thr Leu Pro Asp Asn Pro Phe Ala  
 1665 1670 1675 1680  
 Ser Cys Val Phe Ala Phe Ile Ala Gly Ile Thr Thr Pro Leu Pro His  
 1685 1690 1695  
 Lys Ile Lys Met Phe Leu Ser Leu Phe Gly Gly Ala Ile Ala Ser Lys  
 1700 1705 1710  
 Leu Thr Asp Ala Arg Gly Ala Leu Ala Phe Met Met Ala Gly Ala Ala  
 1715 1720 1725  
 Gly Thr Ala Leu Gly Thr Trp Thr Ser Val Gly Phe Val Phe Asp Met  
 1730 1735 1740  
 Leu Gly Gly Tyr Ala Ala Ala Ser Ser Thr Ala Cys Leu Thr Phe Lys  
 1745 1750 1755 1760  
 Cys Leu Met Gly Glu Trp Pro Thr Met Asp Gln Leu Ala Gly Leu Val  
 1765 1770 1775  
 Tyr Ser Ala Phe Asn Pro Ala Ala Gly Val Val Gly Val Leu Ser Ala  
 1780 1785 1790  
 Cys Ala Met Phe Ala Leu Thr Thr Ala Gly Pro Asp His Trp Pro Asn  
 1795 1800 1805  
 Arg Leu Leu Thr Met Leu Ala Arg Ser Asn Thr Val Cys Asn Glu Tyr  
 1810 1815 1820  
 Phe Ile Ala Thr Arg Asp Ile Arg Arg Lys Ile Leu Gly Ile Leu Glu  
 1825 1830 1835 1840  
 Ala Ser Thr Pro Trp Ser Val Ile Ser Ala Cys Ile Arg Trp Leu His  
 1845 1850 1855  
 Thr Pro Thr Glu Asp Asp Cys Gly Leu Ile Ala Trp Gly Leu Glu Ile  
 1860 1865 1870  
 Trp Gln Tyr Val Cys Asn Phe Phe Val Ile Cys Phe Asn Val Leu Lys  
 1875 1880 1885  
 Ala Gly Val Gln Ser Met Val Asn Ile Pro Gly Cys Pro Phe Tyr Ser  
 1890 1895 1900  
 Cys Gln Lys Gly Tyr Lys Gly Pro Trp Ile Gly Ser Gly Met Leu Gln  
 1905 1910 1915 1920  
 Ala Arg Cys Pro Cys Gly Ala Glu Leu Ile Phe Ser Val Glu Asn Gly  
 1925 1930 1935  
 Phe Ala Lys Leu Tyr Lys Gly Pro Arg Thr Cys Ser Asn Tyr Trp Arg  
 1940 1945 1950  
 Gly Ala Val Pro Val Asn Ala Arg Leu Cys Gly Ser Ala Arg Pro Asp  
 1955 1960 1965  
 Pro Thr Asp Trp Thr Ser Leu Val Val Asn Tyr Gly Val Arg Asp Tyr  
 1970 1975 1980  
 Cys Lys Tyr Glu Lys Leu Gly Asp His Ile Phe Val Thr Ala Val Ser  
 1985 1990 1995 2000  
 Ser Pro Asn Val Cys Phe Thr Gln Val Pro Pro Thr Leu Arg Ala Ala  
 2005 2010 2015  
 Val Ala Val Asp Gly Val Gln Val Gln Cys Tyr Leu Gly Glu Pro Lys  
 2020 2025 2030  
 Thr Pro Trp Thr Thr Ser Ala Cys Cys Tyr Gly Pro Asp Gly Lys Gly  
 2035 2040 2045  
 Lys Thr Val Lys Leu Pro Phe Arg Val Asp Gly His Thr Pro Gly Val  
 2050 2055 2060  
 Arg Met Gln Leu Asn Leu Arg Asp Ala Leu Glu Thr Asn Asp Cys Asn  
 2065 2070 2075 2080

Ser Thr Asn Asn Thr Pro Ser Asp Glu Ala Ala Val Ser Ala Leu Val  
 2085 2090 2095  
 Phe Lys Gln Glu Leu Arg Arg Thr Asn Gln Leu Leu Glu Ala Ile Ser  
 2100 2105 2110  
 Ala Gly Val Asp Thr Thr Lys Leu Pro Ala Pro Ser Ile Glu Glu Val  
 2115 2120 2125  
 Val Val Arg Lys Arg Gln Phe Arg Ala Arg Thr Gly Ser Leu Thr Leu  
 2130 2135 2140  
 Pro Pro Pro Pro Arg Ser Val Pro Gly Val Ser Cys Pro Glu Ser Leu  
 2145 2150 2155 2160  
 Gln Arg Ser Asp Pro Leu Glu Gly Pro Ser Asn Leu Pro Pro Ser Pro  
 2165 2170 2175  
 Pro Val Leu Gln Leu Ala Met Pro Met Pro Leu Leu Gly Ala Gly Glu  
 2180 2185 2190  
 Cys Asn Pro Phe Thr Ala Ile Gly Cys Ala Met Thr Glu Thr Gly Gly  
 2195 2200 2205  
 Gly Pro Asp Asp Leu Pro Ser Tyr Pro Pro Lys Lys Glu Val Ser Glu  
 2210 2215 2220  
 Trp Ser Asp Glu Ser Trp Ser Thr Ala Thr Thr Ala Ser Ser Tyr Val  
 2225 2230 2235 2240  
 Thr Gly Pro Pro Tyr Pro Lys Ile Arg Gly Lys Asp Ser Thr Gln Ser  
 2245 2250 2255  
 Ala Pro Ala Lys Arg Pro Thr Lys Lys Leu Gly Lys Ser Glu Phe  
 2260 2265 2270  
 Ser Cys Ser Met Ser Tyr Thr Trp Thr Asp Val Ile Ser Phe Lys Thr  
 2275 2280 2285  
 Ala Ser Lys Val Leu Ser Ala Thr Arg Ala Ile Thr Ser Gly Phe Leu  
 2290 2295 2300  
 Lys Gln Arg Ser Leu Val Tyr Val Thr Glu Pro Arg Asp Ala Glu Leu  
 2305 2310 2315 2320  
 Arg Lys Gln Lys Val Thr Ile Asn Arg Gln Pro Leu Phe Pro Pro Ser  
 2325 2330 2335  
 Tyr His Lys Gln Val Arg Leu Ala Lys Glu Lys Ala Ser Lys Val Val  
 2340 2345 2350  
 Gly Val Met Trp Asp Tyr Asp Glu Val Ala Ala His Thr Pro Ser Lys  
 2355 2360 2365  
 Ser Ala Lys Ser His Ile Thr Gly Leu Arg Gly Thr Asp Val Arg Ser  
 2370 2375 2380  
 Gly Ala Ala Arg Lys Ala Val Leu Asp Leu Gln Lys Cys Val Glu Ala  
 2385 2390 2395 2400  
 Gly Glu Ile Pro Ser His Tyr Arg Gln Thr Val Ile Val Pro Lys Glu  
 2405 2410 2415  
 Glu Val Phe Val Lys Thr Pro Gln Lys Pro Thr Lys Lys Pro Pro Arg  
 2420 2425 2430  
 Leu Ile Ser Tyr Pro His Leu Glu Met Arg Cys Val Glu Lys Met Tyr  
 2435 2440 2445  
 Tyr Gly Gln Val Ala Pro Asp Val Val Lys Ala Val Met Gly Asp Ala  
 2450 2455 2460  
 Tyr Gly Phe Val Asp Pro Arg Thr Arg Val Lys Arg Leu Leu Ser Met  
 2465 2470 2475 2480  
 Trp Ser Pro Asp Ala Val Gly Ala Thr Cys Asp Thr Val Cys Phe Asp  
 2485 2490 2495  
 Ser Thr Ile Thr Pro Glu Asp Ile Met Val Glu Thr Asp Ile Tyr Ser  
 2500 2505 2510

Ala Ala Lys Leu Ser Asp Gln His Arg Ala Gly Ile His Thr Ile Ala  
           2515                          2520                          2525  
 Arg Gln Leu Tyr Ala Gly Gly Pro Met Ile Ala Tyr Asp Gly Arg Glu  
           2530                          2535                          2540  
 Ile Gly Tyr Arg Arg Cys Arg Ser Ser Gly Val Tyr Thr Thr Ser Ser  
 2545                          2550                          2555                          2560  
 Ser Asn Ser Leu Thr Cys Trp Leu Lys Val Asn Ala Ala Ala Glu Gln  
                           2565                          2570                          2575  
 Ala Gly Met Lys Asn Pro Arg Phe Leu Ile Cys Gly Asp Asp Cys Thr  
                           2580                          2585                          2590  
 Val Ile Trp Lys Ser Ala Gly Ala Asp Ala Asp Lys Gln Ala Met Arg  
                           2595                          2600                          2605  
 Val Phe Ala Ser Trp Met Lys Val Met Gly Ala Pro Gln Asp Cys Val  
                           2610                          2615                          2620  
 Pro Gln Pro Lys Tyr Ser Leu Glu Glu Leu Thr Ser Cys Ser Ser Asn  
 2625                          2630                          2635                          2640  
 Val Thr Ser Gly Ile Thr Lys Ser Gly Lys Pro Tyr Tyr Phe Leu Thr  
                           2645                          2650                          2655  
 Arg Asp Pro Arg Ile Pro Leu Gly Arg Cys Ser Ala Glu Gly Leu Gly  
                           2660                          2665                          2670  
 Tyr Asn Pro Ser Ala Ala Trp Ile Gly Tyr Leu Ile His His Tyr Pro  
                           2675                          2680                          2685  
 Cys Leu Trp Val Ser Arg Val Leu Ala Val His Phe Met Glu Gln Met  
                           2690                          2695                          2700  
 Leu Phe Glu Asp Lys Leu Pro Glu Thr Val Thr Phe Asp Trp Tyr Gly  
 2705                          2710                          2715                          2720  
 Lys Asn Tyr Thr Val Pro Val Glu Asp Leu Pro Ser Ile Ile Ala Gly  
                           2725                          2730                          2735  
 Val His Gly Ile Glu Ala Phe Ser Val Val Arg Tyr Thr Asn Ala Glu  
                           2740                          2745                          2750  
 Ile Leu Arg Val Ser Gln Ser Leu Thr Asp Met Thr Met Pro Pro Leu  
                           2755                          2760                          2765  
 Arg Ala Trp Arg Lys Lys Ala Arg Ala Val Leu Ala Ser Ala Lys Arg  
                           2770                          2775                          2780  
 Arg Gly Gly Ala His Ala Lys Leu Ala Arg Phe Leu Leu Trp His Ala  
 2785                          2790                          2795                          2800  
 Thr Ser Arg Pro Leu Pro Asp Leu Asp Lys Thr Ser Val Ala Arg Tyr  
                           2805                          2810                          2815  
 Thr Thr Phe Asn Tyr Cys Asp Val Tyr Ser Pro Glu Gly Asp Val Phe  
                           2820                          2825                          2830  
 Val Thr Pro Gln Arg Arg Leu Gln Lys Phe Leu Val Lys Tyr Leu Ala  
                           2835                          2840                          2845  
 Val Ile Val Phe Ala Leu Gly Leu Ile Ala Val Gly Leu Ala Ile Ser  
                           2850                          2855                          2860

&lt;210&gt; 4

&lt;211&gt; 35

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Partial GBV-B Replicon Sequence

&lt;400&gt; 4

gaccgtagca catggggcgc gccatgattg aacaa

35

<210> 5  
 <211> 56  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Partial GBV-B Replicon Sequence

<400> 5  
 gaccgtagca catgcctggt atttctactc aaacagggcg cgccatgatt gaacaa 56

<210> 6  
 <211> 74  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Partial GBV-B Replicon Sequence

<400> 6  
 gaccgtagca catgcctggt atttctactc aaacaagtcc tgtacctgcg cccgggcgcg 60  
 ccatgattga acaa 74

<210> 7  
 <211> 98  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Partial GBV-B Replicon Sequence

<400> 7  
 gaccgtagca catgcctggt atttctactc aaacaagtcc tgtacctgcg cccagaacgc 60  
 gcaagaacaa gcagacgggg cgcgccatga ttgaacaa 98

<210> 8  
 <211> 8  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Partial GBV-B Replicon Sequence

<400> 8  
 Met Gly Arg Ala Met Ile Glu Gln  
 1 5

<210> 9  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Partial GBV-B Replicon Sequence

<400> 9  
 Met Pro Val Ile Ser Thr Gln Thr Gly Arg Ala Met Ile Glu Gln  
 1 5 10 15

<210> 10  
 <211> 21  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Partial GBV-B Replicon Sequence

<400> 10  
 Met Pro Val Ile Ser Thr Gln Thr Ser Pro Val Pro Ala Pro Gly Arg  
 1 5 10 15  
 Ala Met Ile Glu Gln  
 20

<210> 11  
 <211> 29  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Partial GBV-B Replicon Sequence

<400> 11  
 Met Pro Val Ile Ser Thr Gln Thr Ser Pro Val Pro Ala Pro Arg Thr  
 1 5 10 15  
 Arg Lys Asn Lys Gln Thr Gly Arg Ala Met Ile Glu Gln  
 20 25

<210> 12  
 <211> 291  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Partial HCV Replicon Sequence

<221> MOD\_RES  
 <222> (29)...(29)  
 <223> Xaa = Glu or Gly

<221> MOD\_RES  
 <222> (107)...(107)  
 <223> Xaa = Thr or Ile

<221> MOD\_RES  
 <222> (124)...(124)  
 <223> Xaa = Asp, Gly, His, or Asn

<221> MOD\_RES  
 <222> (136)...(136)

<223> Xaa = Arg or Gly

<221> MOD\_RES

<222> (142)...(142)

<223> Xaa = Pro or Ser

<221> MOD\_RES

<222> (143)...(143)

<223> Xaa = Pro or Cys

<221> MOD\_RES

<222> (146)...(146)

<223> Xaa = Ala, Asp, Ser, or Thr

<221> MOD\_RES

<222> (151)...(151)

<223> Xaa = Ser, Ile, or Arg

<221> MOD\_RES

<222> (245)...(245)

<223> Xaa = Arg or Gly

<400> 12

Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val
1				5					10					15	
Ala	Lys	Ala	Val	Asp	Phe	Val	Pro	Val	Glu	Ser	Met	Xaa	Thr	Thr	Met
			20					25					30		
Arg	Ser	Pro	Val	Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro	Gln
		35					40					45			
Thr	Phe	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys	Ser
	50					55					60				
Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val
65				70						75				80	
Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser
			85					90						95	
Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Xaa	Gly	Val	Arg	Thr	Ile
		100						105					110		
Thr	Thr	Gly	Ala	Pro	Leu	Thr	Ser	Met	Leu	Thr	Xaa	Pro	Ser	His	Ile
		115					120					125			
Thr	Ala	Glu	Thr	Ala	Lys	Arg	Xaa	Leu	Ala	Arg	Gly	Ser	Xaa	Xaa	Ser
	130				135						140				
Leu	Xaa	Ser	Ser	Ser	Ala	Xaa	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala
145					150					155				160	
Thr	Cys	Thr	Thr	Arg	His	Asp	Ser	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala
			165						170					175	
Asn	Leu	Leu	Trp	Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu
		180						185					190		
Ser	Glu	Asn	Lys	Val	Val	Ile	Leu	Asp	Ser	Phe	Glu	Pro	Leu	Gln	Ala
		195					200					205			
Glu	Glu	Asp	Glu	Arg	Glu	Val	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Arg
	210				215						220				
Ser	Arg	Lys	Phe	Pro	Arg	Ala	Tyr	Ser	Ile	Glu	Pro	Leu	Asp	Leu	Pro
225					230					235				240	
Gln	Ile	Ile	Gln	Xaa	Leu	His	Gly	Leu	Ser	Ala	Phe	Ser	Leu	His	Ser
			245					250						255	



Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala Ser Cys Leu Arg Lys Leu  
                   260                  265                  270  
 Gly Val Pro Pro Leu Arg Val Trp Arg His Arg Ala Arg Ser Val Arg  
                   275                  280                  285  
 Ala Arg Leu  
                   290

<210> 13

<211> 270

<212> PRT

<213> Artificial Sequence

<220>

<223> Partial GBV-B Replicon Sequence

<400> 13

Gly His Val Ile Gly Met Phe Thr Ala Ala Arg Asn Ser Gly Gly Ser  
   1                  5                  10                  15  
 Val Ser Gln Ile Arg Val Arg Pro Leu Val Cys Ala Gly Tyr His Pro  
                   20                  25                  30  
 Gln Tyr Thr Ala His Ala Thr Leu Asp Thr Lys Pro Thr Val Pro Asn  
                   35                  40                  45  
 Glu Tyr Ser Val Gln Ile Leu Ile Ala Pro Thr Gly Ser Gly Lys Ser  
   50                  55                  60  
 Thr Lys Leu Pro Leu Ser Tyr Met Gln Glu Lys Tyr Glu Val Leu Val  
  65                  70                  75                  80  
 Leu Asn Pro Ser Val Ala Thr Thr Ala Ser Met Pro Lys Tyr Met His  
                   85                  90                  95  
 Ala Thr Tyr Gly Val Asn Pro Asn Cys Tyr Phe Asn Gly Lys Cys Thr  
                  100                 105                 110  
 Asn Thr Gly Ala Ser Lys Thr Val Lys Leu Pro Phe Arg Val Asp Gly  
                  115                 120                 125  
 His Thr Pro Gly Val Arg Met Gln Leu Asn Leu Arg Asp Ala Leu Glu  
  130                 135                 140  
 Thr Asn Asp Cys Asn Ser Thr Asn Asn Thr Pro Ser Asp Glu Ala Ala  
  145                 150                 155                 160  
 Val Ser Ala Leu Val Phe Lys Gln Glu Leu Arg Arg Thr Asn Gln Leu  
                  165                 170                 175  
 Leu Glu Ala Ile Ser Ala Gly Val Asp Thr Thr Lys Leu Pro Ala Pro  
                  180                 185                 190  
 Ser Ile Glu Glu Val Val Val Arg Lys Arg Gln Phe Arg Ala Arg Thr  
                  195                 200                 205  
 Gly Ser Tyr Thr Val Pro Val Glu Asp Leu Pro Ser Ile Ile Ala Gly  
  210                 215                 220  
 Val His Gly Ile Glu Ala Phe Ser Val Val Arg Tyr Thr Asn Ala Glu  
  225                 230                 235                 240  
 Ile Leu Arg Val Ser Gln Ser Leu Thr Asp Met Thr Met Pro Pro Leu  
                  245                 250                 255  
 Arg Ala Trp Arg Lys Lys Ala Arg Ala Val Leu Ala Ser Ala  
                  260                 265                 270

<210> 14

<211> 18

<212> DNA

<213> Artificial Sequence

<220>  
<223> Oligonucleotide Primer

<400> 14  
gtaggcggcg ggactcat 18

<210> 15  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide Primer

<400> 15  
tcagggccat ccaagtcaa 19

<210> 16  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide Probe

<400> 16  
tcgcgtgatg acaagcgcca ag 22

<210> 17  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide Primer

<400> 17  
gatggattgc acgcagggtt 19

<210> 18  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide Primer

<400> 18  
cccagtcata gccgaatagc c 21

<210> 19  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Oligonucleotide Probe

<400> 19

tccggccgct tgggtggag

19